Anopheles amictus Edwards and the Subspecies Concept

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ABSTRACT The history of the category subspecies, and of the taxon *Anopheles amictus hilli* Woodhill and Lee, is briefly reviewed. The taxon is promoted to species rank.

The subspecies is by no means universally accepted as a useful taxonomic category (Mayr, 1969: 42); but those who do accept it seem agreed that it is best reserved for a single, general case: where populations known or reasonably suspected to be capable of interbreeding are prevented from doing so regularly by physical or temporal barriers. Obviously, there should also be marked differences between attributes of those populations, to make it worthwhile calling them by different names. In the case of contemporaneous populations, which is what concerns me here, the barriers are usually geographic and their persistence not guaranteed. The category subspecies thus allows us formally to recognise significant taxonomic diversity without compromising the concept of the "biological species', and protects the integrity of a classification against geographic accidents.

Whether all that is defensible, in theory or practice, is beside the point here. Whatever one's views, there is little reason for holding two taxa at subspecies rank if they coexist in the same area, at the same time, without any signs of intergradation; i.e., if they credibly represent two populations that refuse to interbreed and merge when given every chance to do so. The Australian Anophelini exhibit such an anomaly, which I propose here to rectify while supplying a footnote to the history of taxonomy.

The subspecies *Anopheles amictus hilli* Woodhill and Lee was erected on the basis of small but constant differences from *A.a. amictus* Edwards (Woodhill and Lee, 1944a). The authors explicitly noted their awareness of the "New Systematics", which was then a lusty infant; but they saw it (op. cit., p.62, footnote) as a way of explaining the existence of subspecies, rather than a theoretical basis for allocating certain distinctive taxa to that category. The difference is interesting, and reflects a great change in attitudes to taxonomic practice over the last 50 years or so; and a secondary purpose of this note is to suggest that present day taxonomists might reflect on the point to their advantage.

When the term "subspecies" first gained currency, taxonomists of Culicidae tended to equate it with the older, Linnaean term "variety", to denote taxa that were clearly separable but on the basis of relatively few characters (the synonymies listed in Reid, 1968, supply many case histories). For quite a long while there was considerable resistance, particularly from editors, to the notion of the species as a dynamic, biological phenomenon, rather than a static, physical one (Colless, 1954); and taxonomic policy makers in the World Health Organisation leapt into the 18th century by embalming the Linnaean concept in official dogma (in a definition of "subspecies").

However, I can absolve Woodhill and Lee of any guilt in that regard. I clearly recall conversations in which they took the then-reasonable view that the subspecies of *amictus* were obviously very similar genetically; that their distinctness was probably maintained by subtle, but perhaps fragile, differences in mating behaviour (such as we have come to call "premating isolating mechanisms"); and that their persistance as separate identities was therefore poorly guaranteed. Only later was the durability of such mechanisms generally recognised.

In this day and age, then, continued acceptance of the two taxa as subspecies of *A. amictus* is anomalous. As stated by Woodhill and Lee (op. cit.), "the two forms are both morphologically and biologically distinct" (for larvae, see Woodhill and Lee, 1944b) and there is a "complete absence of indeterminate specimens". They also coexist over much of their known ranges, although (significantly) only *hilli* has been found in New Guinea. By modern criteria they are 'good' species, as proposed in the nomenclature set out below:

Anopheles (Cellia) amictus Edwards

Anopheles amictus Edwards, 1921. Bull. ent. Res. 12:71
Anopheles amictus amictus Woodhill and Lee, 1944. Proc. Linn. Soc. N.S.W.69:62; and subsequent authors.

Anopheles (Cellia) hilli Woodhill and Lee

Anopheles amictus hilli Woodhill and Lee, 1944. Proc. Linn. Soc. N.S.W. 69:63; and subsequent authors.

References

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Mayr, E. 1969. Principles of Systematic Zoology. McGraw Hill. New York. 428 p.

Reid, J. A. 1968. Anopheline Mosquitoes of Malaya and Borneo. Stud. Inst. Med. Res. Malaysia No. 31. Govt. of Malaysia. 520 p.

Woodhill, A. R., and Lee, D. J. 1944a. The subspecies of *Anopheles amictus* Edwards (Diptera, Culicidae). Proc. Linn. Soc. N.S.W. 69:62-66.

Woodhill, A. R., and Lee, D. J. 1944b. The Anopheline Mosquitoes of the Australasian Region. University of Sydney, Dept. of Zoology, Monogr. No. 2 209 p.